

In the Claims:

1. (Currently amended) An electrode array, comprising:

an electrode support;

a group of electrodes mounted on the electrode support for measuring electrical activity in a subject's biological tissue; and

an inter-electrode conductive medium having a given resistivity for controlling, during electrical activity measurement, resistivity between the electrodes of the group to improve said electrical activity measurement, the inter-electrode conductive medium including a coating formed of a first layer of conductive material applied to at least one electrode of the group and to the electrode support between the electrodes and a second layer of slippery conductive material applied to the first layer of conductive material to provide a lubricious interface to the subject's biological tissue.

wherein, when electrical contact between at least one electrode of the group and the subject's biological tissue is poor, the inter-electrode conductive medium forms a means for producing on said at least one electrode an estimate of the electrical activity in the subject's biological tissue, said estimate being a mean value of electrical potentials produced on neighbouring electrodes of the group by the electrical activity in the subject's biological tissue.

2. (Cancelled)

3. (Original) An electrode array as defined in claim 1, wherein the inter-electrode conductive medium includes a reference electrode.

4. (Original) An electrode array as defined in claim 1, wherein:

the electrodes of the group are made of a material having a first resistivity; and

the inter-electrode conductive medium has a second resistivity considerably higher than the first resistivity.

5. (Currently amended) An electrode array as defined in claim 1, wherein:

the subject's biological tissue has a first resistivity; and

the inter-electrode conductive medium is made of a material having has a second resistivity situated within a range near the first resistivity.

6. (Cancelled)

7. (Currently amended) An electrode array as defined in claim [[6]]1, wherein the electrically conductive material of at least one of the first and second layers of the coating is selected from the group consisting of: a semi-conductor, a semi-conductor polymer, an absorbent material, a hydrophilic material, a carbonized material, a liquid containing material, an electrolyte, and a hydrogel.

8. (Original) An electrode array as defined in claim 1, wherein the electrode array is a linear array of electrodes.

9. (Currently amended) An electrode array, comprising:

a catheter with a distal end section;

a series of electrodes mounted on the distal end section of the catheter for measuring electrical activity in a subject's biological tissue; and

an inter-electrode conductive medium having a given resistivity for controlling, during electrical activity measurement, resistivity between the electrodes of the series to improve said electrical activity measurement, the inter-electrode conductive medium including a coating formed of a first layer of conductive material applied to at least one electrode of the series and to the electrode support between the electrodes and a second layer of slippery conductive material applied to the first layer of conductive material to provide a lubricious interface to the subject's biological tissue,

wherein, when contact between at least one electrode of the series and the subject's biological tissue is poor, the inter-electrode conductive medium forms a means for producing on said at least one electrode an estimate of the electrical activity in the subject's biological tissue, said estimate being a mean value of electrical potentials produced on neighbouring electrodes of the series by the electrical activity in the subject's biological tissue.

10. (Cancelled)

11. (Original) An electrode array as defined in claim 9, wherein the inter-electrode conductive medium includes a reference electrode.

12. (Original) An electrode array as defined in claim 9, wherein:

the electrodes of the series are made of a material having a first resistivity; and  
the inter-electrode conductive medium has a second resistivity considerably higher than  
the first resistivity.

13. (Currently amended) An electrode array as defined in claim 9, wherein:

the subject's biological tissue has a first resistivity; and  
the inter-electrode conductive medium is made of a material having has a second  
resistivity situated within a range near the first resistivity.

14. (Cancelled)

15. (Currently amended) An electrode array as defined in claim [[14]]2, wherein the electrically conductive material of at least one of the first and second layers of the coating is selected from the group consisting of: a semi-conductor, a semi-conductor polymer, an absorbent material, a hydrophilic material, a carbonized material, a liquid containing material, an electrolyte, and a hydrogel.

16. (Original) An electrode array as defined in claim 9, wherein the series of electrodes have a constant inter-electrode distance.

17. (Original) An electrode array as defined in claim 9, wherein:

the catheter comprises an outer face and a lumen through which isolated electrical wires run;  
the electrical wires comprise respective non isolated distal end sections;

the distal end section of the catheter comprise a series of holes extending from the lumen to the outer face of the catheter; and

the non isolated distal end section of each electrical wire extends through a corresponding one of said holes and is turned around the outer face of the catheter for at least one turn to form one of the electrodes of the series.

18. (Original) An electrode array as defined in claim 9, further comprising two pressure balloons mounted on the catheter on respective opposite sides of the series of electrodes, wherein the catheter comprises pressure lumens through which the pressure balloons are inflated to fixedly position the series of electrodes about the subject's biological tissue.

19. (Original) An electrode array as defined in claim 9, wherein:

the catheter comprises an outer face and a plurality of lumens;

the electrode array comprises a plurality of electrical wires running through the lumens of the catheter, respectively; and

each electrical wire comprises a non insulated distal end section exposed on the outer face of the catheter to form one of the electrodes of the series, the non insulated distal end section of said electrical wire being exposed through a hole extending from the corresponding lumen to the outer face of the catheter.

20. (Currently amended) An electrode array, comprising:

a catheter with a distal end section;

a series of electrodes mounted on the distal end section of the catheter; and

an inter-electrode conductive medium having a given resistivity for controlling resistivity between the electrodes of the series, wherein the inter-electrode conductive medium comprises a coating formed of:

a first layer of hydrophilic medical grade polyurethane applied to both the electrodes of the series and an outer face of the catheter between the electrodes; and

a second layer made of a slippery material and applied to the first layer to form a lubricious interface to the subject's biological tissue.

21. (Currently amended) A method of controlling an inter-electrode resistivity in an electrode array including a group of electrodes for measuring electrical activity in a subject's biological tissue, comprising providing applying an inter-electrode conductive medium having a given resistivity between the electrodes of the group, the inter-electrode conductive medium including a coating formed of a first layer of conductive material applied to the electrodes of the group and a second layer of slippery conductive material applied to the first layer of conductive material to provide a lubricious interface to the subject's biological tissue, and interconnecting the electrodes of the group through said inter-electrode conductive medium to thereby control, during electrical activity measurement, resistivity between said electrodes to improve said electrical activity measurement, said method further comprising, when contact between at least one electrode of the group and the subject's biological tissue is poor, producing on said at least one electrode an estimate of the electrical activity in the subject's biological tissue through the inter-electrode conductive medium, said estimate being a mean value of electrical potentials produced on neighbouring electrodes of the group by the electrical activity in the subject's biological tissue.

22. (Cancelled)

23. (Original) A method as recited in claim 21, further comprising including a reference electrode to the inter-electrode conductive medium.

24. (Original) A method as recited in claim 21, wherein:

the electrodes of the group are made of a material having a first resistivity; and  
said method comprises providing an inter-electrode conductive medium having a second resistivity considerably higher than the first resistivity.

25. (Currently amended) A method as recited in claim 21, wherein:

the subject's biological tissue has a first resistivity; and  
said method comprises providing an inter-electrode conductive medium made of a material having a second resistivity situated with a range near the first resistivity.

26. (Currently amended) A method as recited in claim 21, wherein:

the electrode array comprises a support for the electrodes; and

interconnecting the electrodes of the group through the inter-electrode conductive medium comprises applying [[a]] the first layer of the coating of said electrically conductive medium on the electrodes of the group and the electrode support between the electrodes.

27. (Currently amended) A method as recited in claim 26, wherein applying [[a]] the first layer of the coating comprises applying a ~~coating~~ of a material selected from the group consisting of: a semi-conductor, a semi-conductor polymer, an absorbent material, a hydrophilic material, a carbonized material, a liquid containing material, an electrolyte, and a hydrogel.

28. (New) An electrode array as defined in claim 1, wherein the electrically conductive material of the first layer of the coating includes hydrophilic medical grade polyurethane.

29. (New) An electrode array as defined in claim 28, wherein the hydrophilic medical grade polyurethane has a water content of about 50%.

30. (New) An electrode array as defined in claim 1, wherein the electrically conductive material of the second layer of the coating includes hydrophilic medical grade polyurethane.

31. (New) An electrode array as defined in claim 30, wherein the hydrophilic medical grade polyurethane has a water content of about 90%.

32. (New) An electrode array as defined in claim 1, wherein the coating includes at least one further layer of conductive material.

33. (New) An electrode array as defined in claim 9, wherein the electrically conductive material of the first layer of the coating includes hydrophilic medical grade polyurethane.

34. (New) An electrode array as defined in claim 32, wherein the hydrophilic medical grade polyurethane has a water content of about 50%.

34. (New) An electrode array as defined in claim 9, wherein the electrically conductive material of the second layer of the coating includes hydrophilic medical grade polyurethane.
35. (New) An electrode array as defined in claim 34, wherein the hydrophilic medical grade polyurethane has a water content of about 90%.
36. (New) An electrode array as defined in claim 9, wherein the coating includes at least one further layer of conductive material.